

Local knowledge for combatting land degradation, desertification and drought

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http://www.afes-press.de/html/download_oswald.html

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1. Hypothesis

How can traditional knowledge contribute to combat land degradation and desertification, and to adapt efficiently to drought?

How are peasants, indigenous and women dealing with the nexus of water, soil, food and biodiversity (WSF&B), triggered by climate change impacts?

2. Soil, water, biodiversity and climate relation



Desertification Land Degradation & Drought

Mitigation & Adaptation

Reduced primary
production & nutrient
cycling

droughts

land degradation

urbanization
in drylands

soil erosion

compaction of soils

water erosion

salinization
sodification

aquifer depletion

mining activities

land use change

reduced soil
conservation

fauna loss

plant diseases
& resistance

decrease in organic
matters in soils

lack of water
and food

BIODIVERSITY LOSS

change in community structure
& ethnic diversity

migration
urbanization
slums

forest fires

land slides

hydro meteorological
disasters

WATER STRESS

rainfall variability

sea level rise

pollution

accumulation of toxic substance
in water & soil

watershed degradation

poor irrigation

extreme weather events

increase of
social vulnerability, poverty

reduced carbon reserves
& increased CO₂

Reduced carbon sequestration
above & below ground
carbon reserves

CLIMATE CHANGE

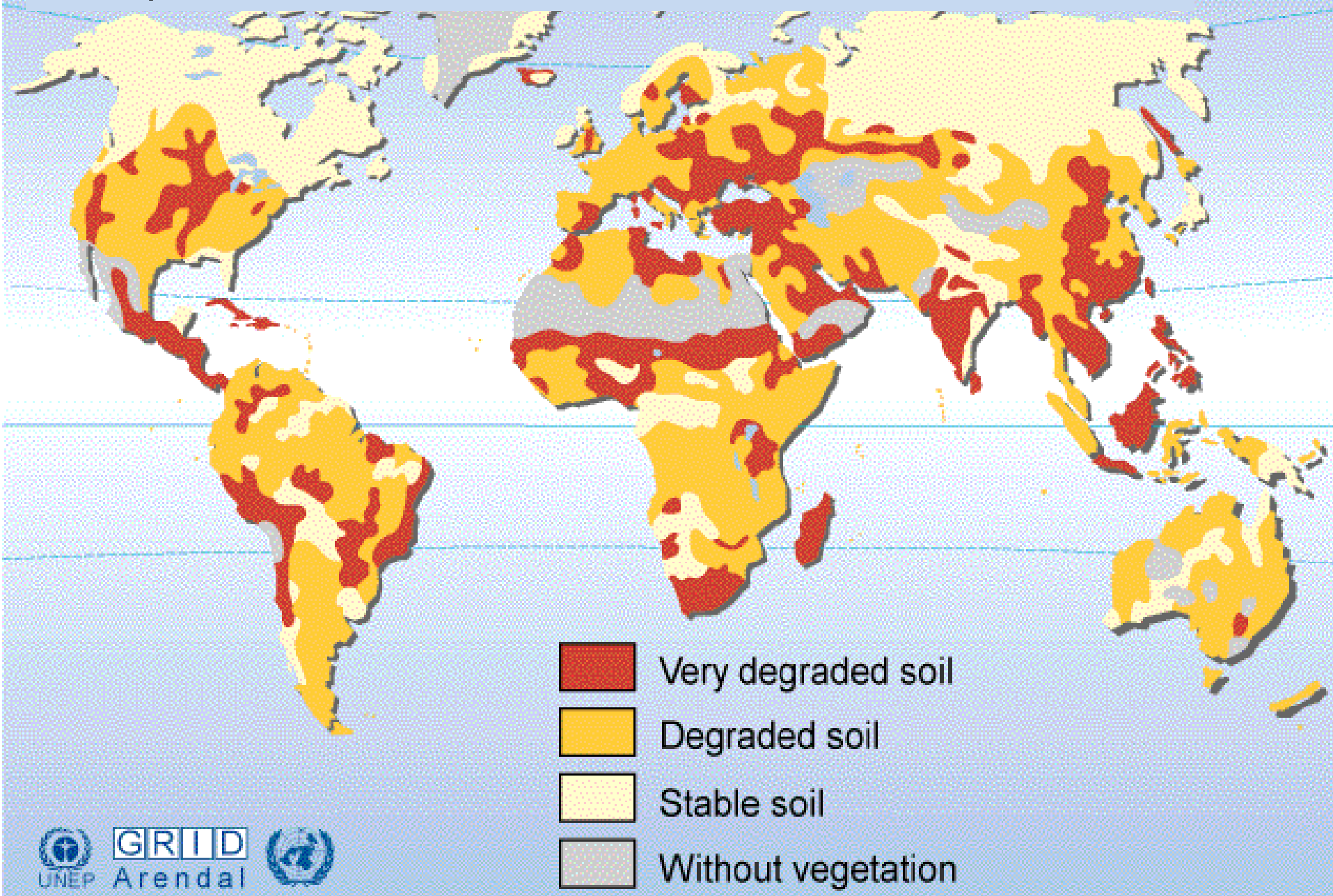
global temperature increase
climate variability

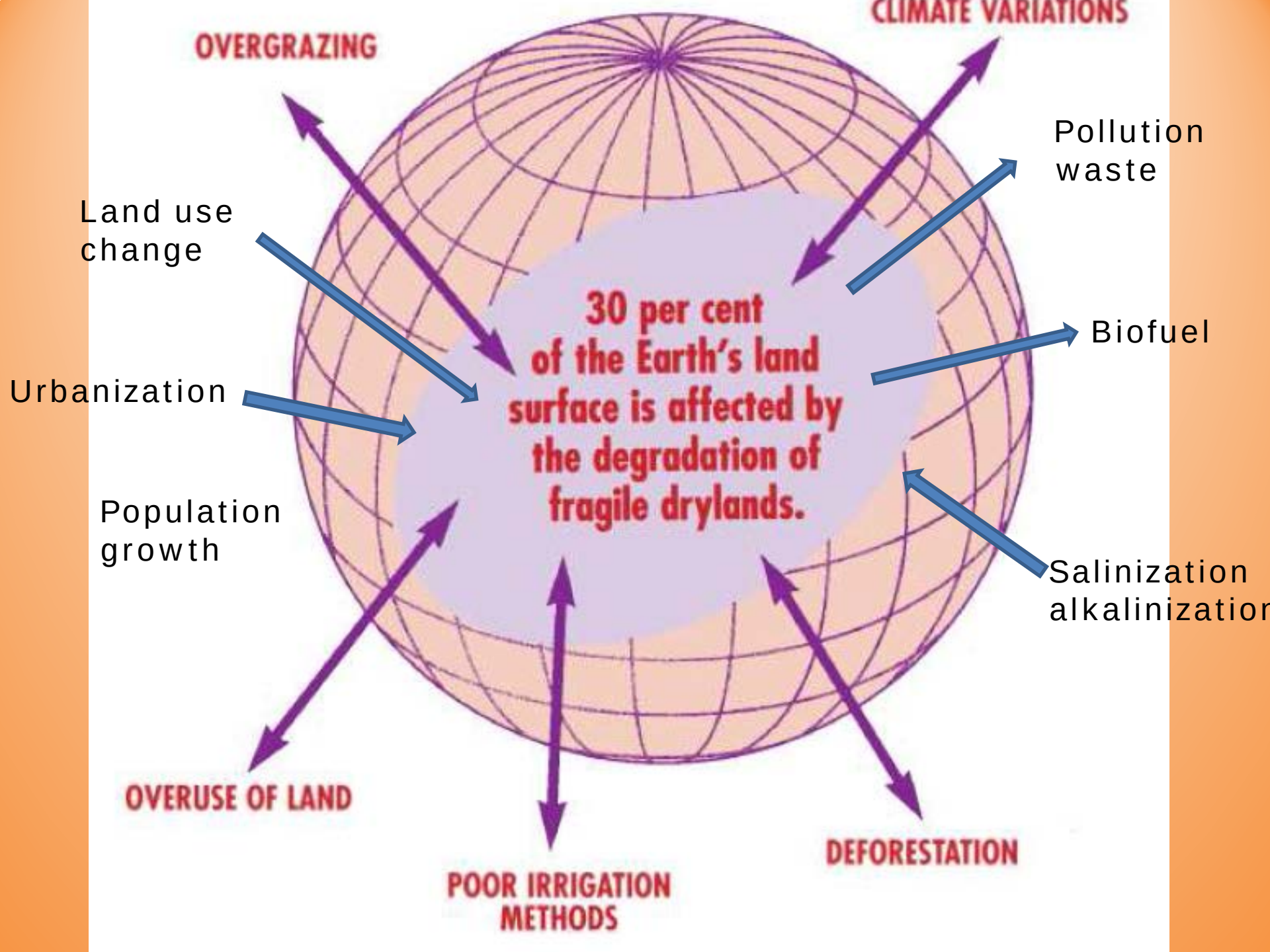
decreased land & soil
organism' species diversity

3. Combatting land degradation in indigenous and peasant societies in Latin America



3. Combatting land degradation in indigenous and peasant societies in Latin America





Land degradation & desertification

- 2 billion people live in drylands (41% of Earth)
- **Natural causes:** Water scarcity limits crops; droughts; wood, forage and other ecosystem services & important and persistent water scarcity related to climate change increase desertification and affects capture of CO₂ on the planet; vegetative cover degradation, wind and water erosion by flash floods, biodiversity loss, bush encroachment, physical soil degradation, fresh water reduction, salinization and alkalisation of soils, pollution, soil fertility loss, and sandification
- **Anthropogenic causes:** agricultural mismanagement; deforestation; illegal logging; land use change; slope steepness; poor soils; resources overexploitation; inadequate waste management; overfertilization; overgrazing; overplowing; urbanization; population growth; migration; mining; poverty

Global Hunger Index

Legend:

- ≥ 35.0 Extremely alarming
- 25.0-34.9 Alarming
- 15.0-24.9 Serious
- 5.0-14.9 Moderate
- ≤ 4.9 Low
- No data
- Industrialized country

Source: See Mathers E., et al. (2014) Global Hunger Index 2014. International Institute for Nutrition, University of Michigan, USA. For more information, visit www.globalhungerindex.org

Global Hunger Index 2014

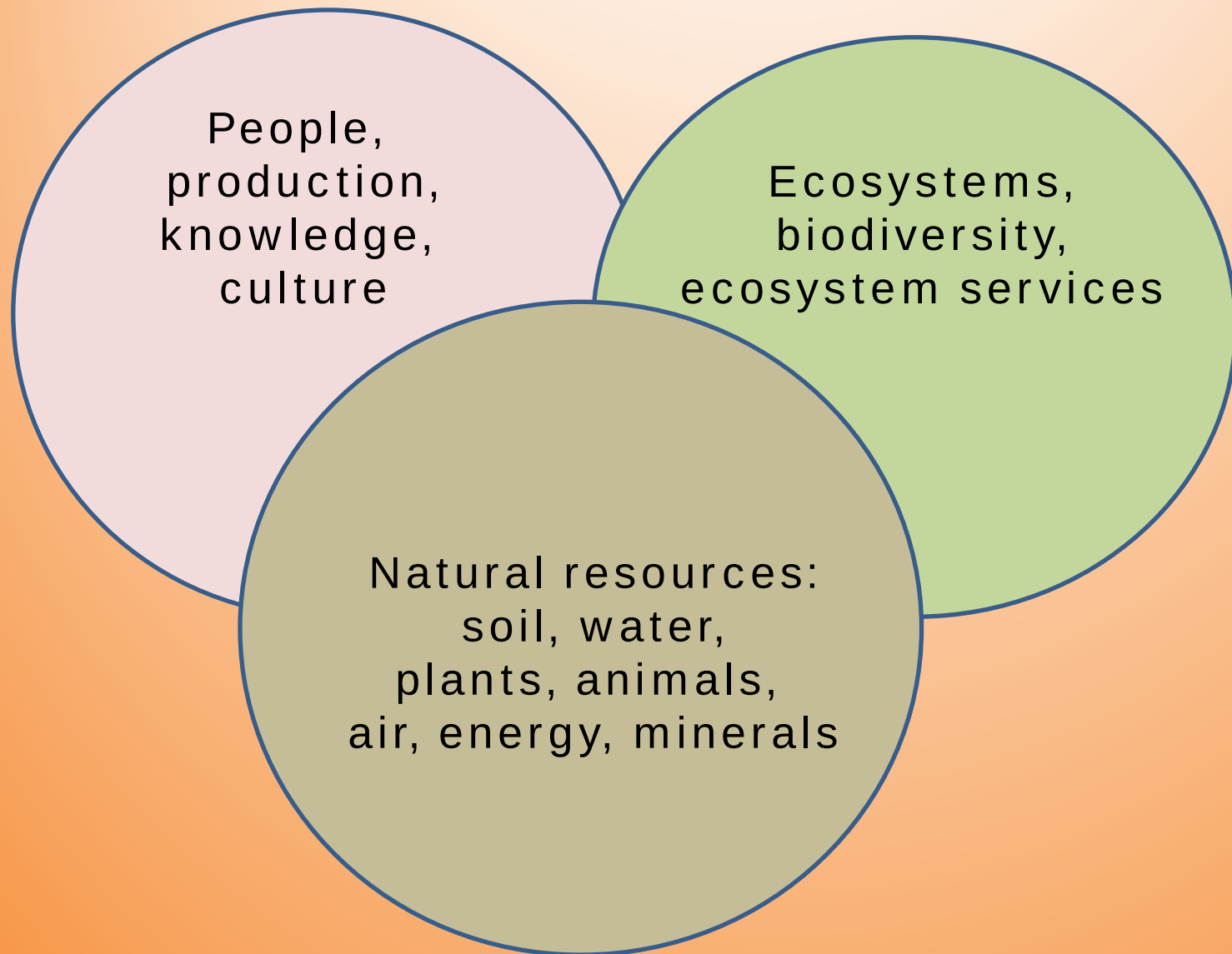
INTERNATIONAL INSTITUTE FOR NUTRITION

CONCERN WORLDWIDE

Journal of Marketing, 4, 31. Steiner, J. (1964). *Marketing*. Englewood Cliffs, NJ: Prentice-Hall.

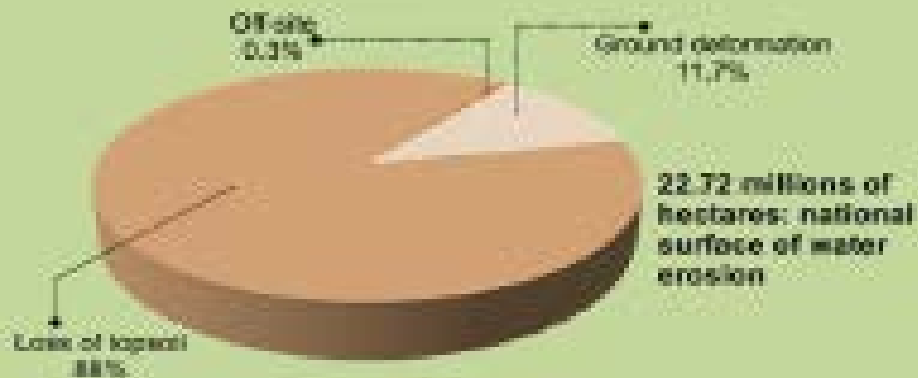


Systemic interaction of nature & people

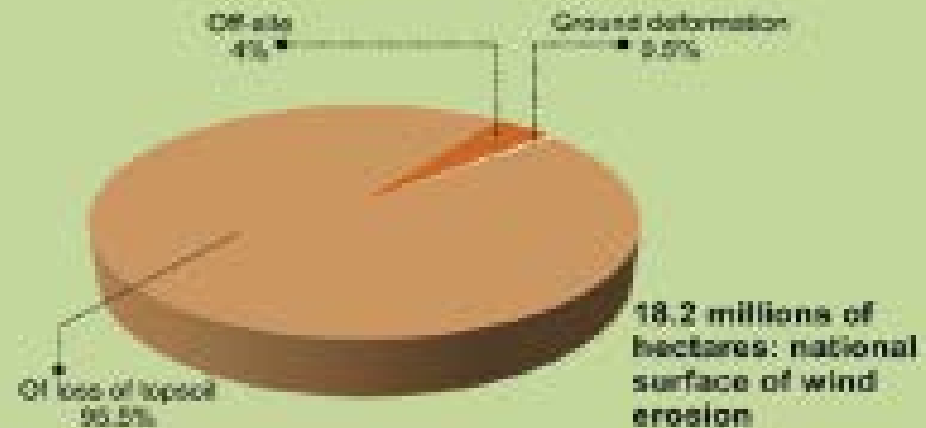


Soil management at risk

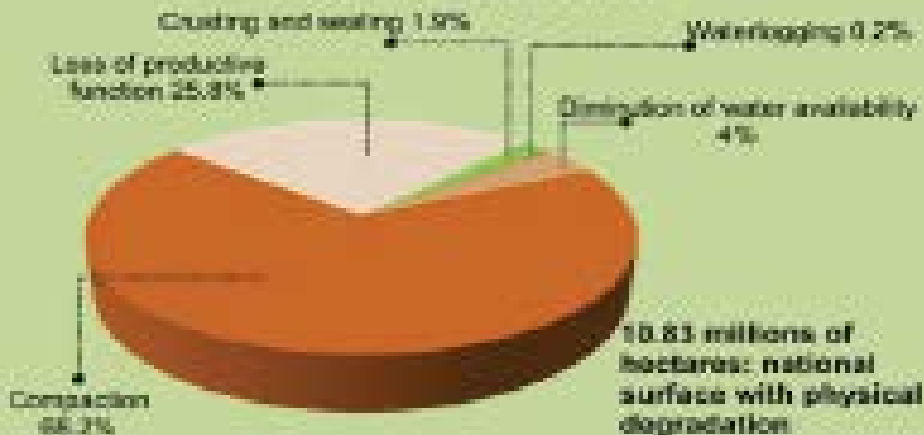
Water erosion



Wind erosion



Physical degradation

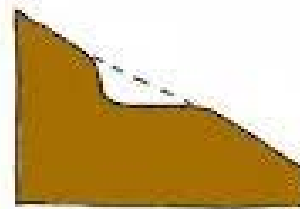


Chemical degradation

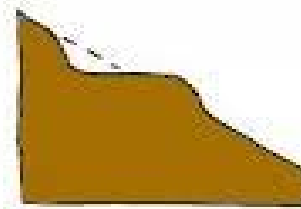




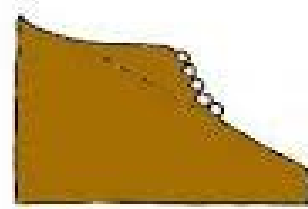
4. Local
knowledge:
experimental
accumulation
of traditional
technologies



Cut Into Slope



Combo



Built Out

Obstacles and actions for soil management

Obstacles

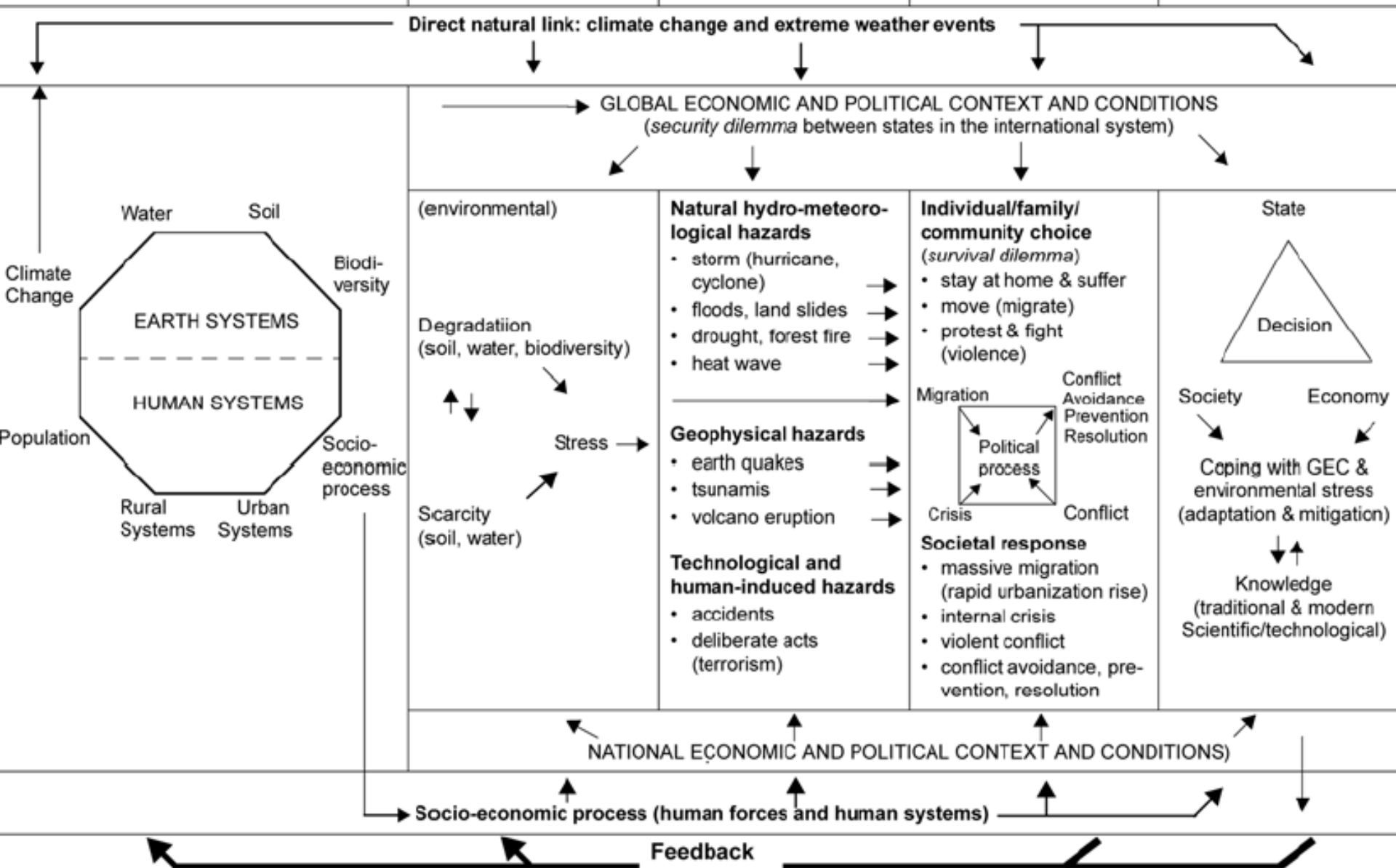
- **Policy failures:** breakdown of indigenous & local institutions; lack of non-farm employments; unsupportive policies, institutions and markets; inadequate environmental policy; land mismanagement; tenure insecurity; inappropriate soil management, lack of knowledge of alternative technologies; unplanned land use change & urban growth; limited access to farm inputs and credit;
- **Market failures:** Biofuel policies; demand of cattle, crop and forest products; livestock pressure and demand for extended rangeland.



5. Local and regional practices to combat LDDD

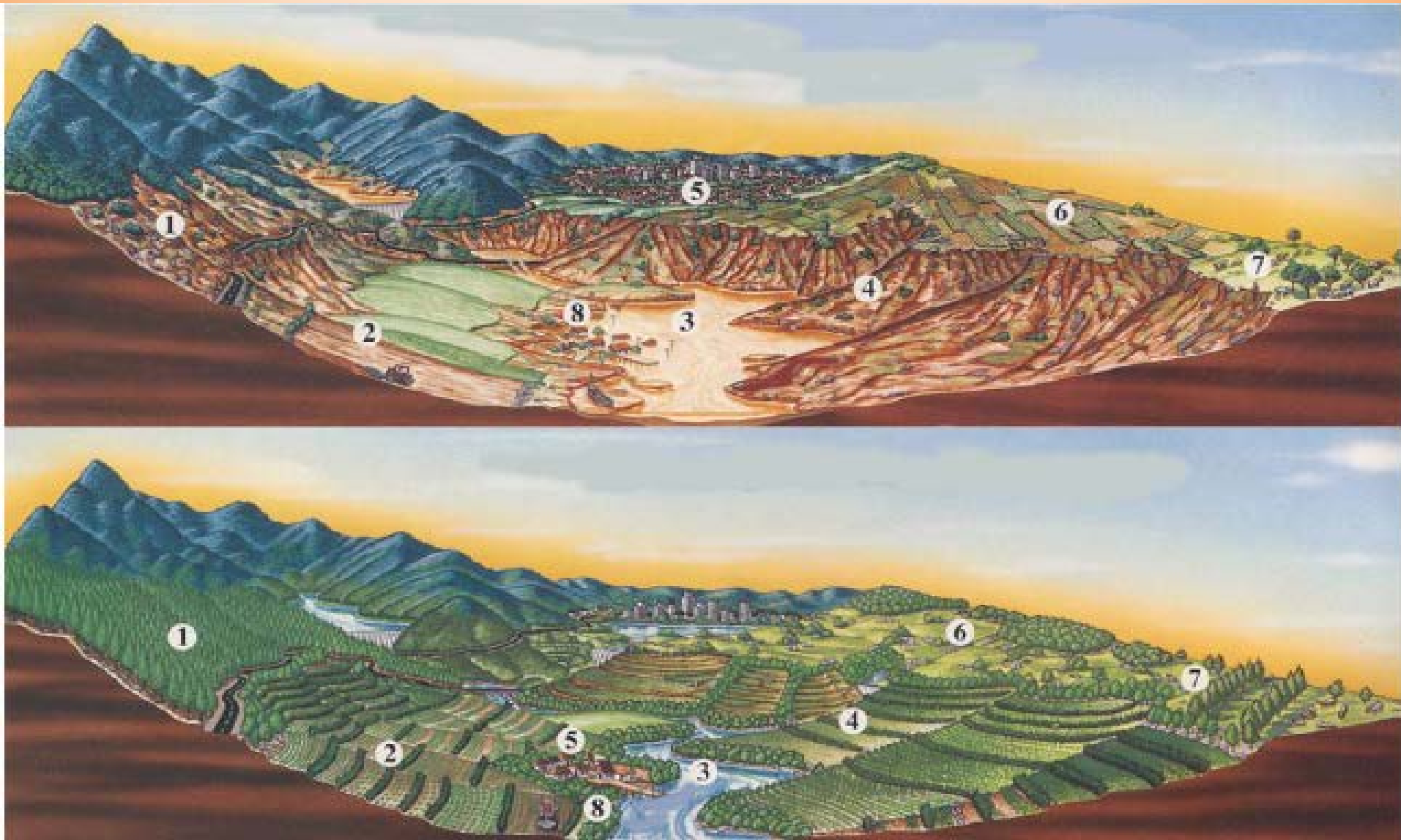


Pressure	Effect	Impact	Societal Outcome	(Policy) Response
Causes of <i>Global Environmental Change (GEC)</i>	Socio-economic interaction Environmental scarcity, degradation and stress	Natural and human-induced hazards	Individual choice (<i>survival dilemma</i>) Societal response	National and international political process, state, societal and economic actors and knowledge



6. Water, soil, agriculture & climate interactions

Source: Souza, Brazil, Org. Solos



Integrated soil management

1. **Conservation:** maintain natural flora, fauna, biodiversity, water, soil and air
2. **Use:** give any environmental unit a sustainable management; maintain soils and natural resources with sustainable agricultural production; establish local seed banks and interchange them with neighbours
3. **Protection:** Conserve soil, biodiversity, water, and local food culture
4. **Restoration:** increase soil humidity, associate different crops, establish traditional medical plants, reforest with species to reduce deforestation for biomass use; avoid and clean waste water and recycle it locally; store rain water and infiltrate it into aquifers; diversify rural activities and incomes; recover traditional knowledge and culture; improve local livelihood, resolve locally conflicts



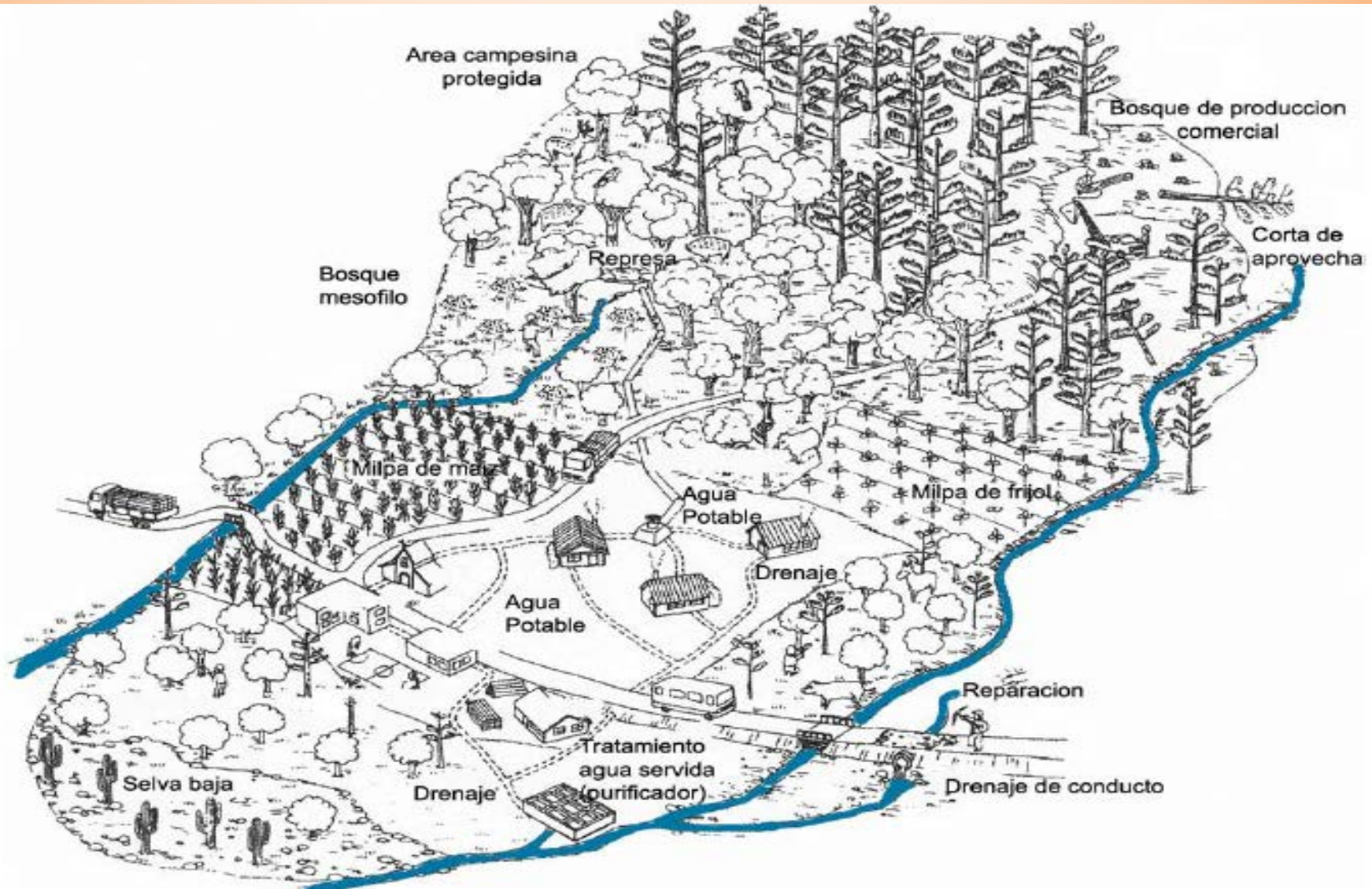
Land planning

Establishment of local and regional land use plans:

1. **Human settlements:** respect local plans and limits, trace streets and common places, maintain green areas, schools and parks, develop reserves for future enlargement; construction of latrines or dry sanitary; dying cattle and dead animals must be buried; renewable energies (sun, wind, biomass),
2. **Clear rules for common areas** for cattle growing, firewood recollection, slash burning only with 2m wide ditches to avoid bush fires and inform authorities: do not burn when winds are strong
3. **Extensive cattle growing:** avoid it in natural areas, confine cattle in stables and manage their excrements with bio-digestors for natural fertilization of soils and crops
4. **Hunting and fishing:** only allowed during the hunting season, fishing and hunting with clear established closed season to reinforce natural reproduction; develop local environmental unities and ecotourism (e.g. pheasant), prohibited trafficking of wild species
5. **Forest and conservation areas:** delimit collectively areas of low impact forest management, reforest areas for fire wood
6. **Protected areas:** prohibited to do productive activities and hunting

Integrated management of land, soil, water, food, biodiversity and human settlements

Source. Boege, : 68

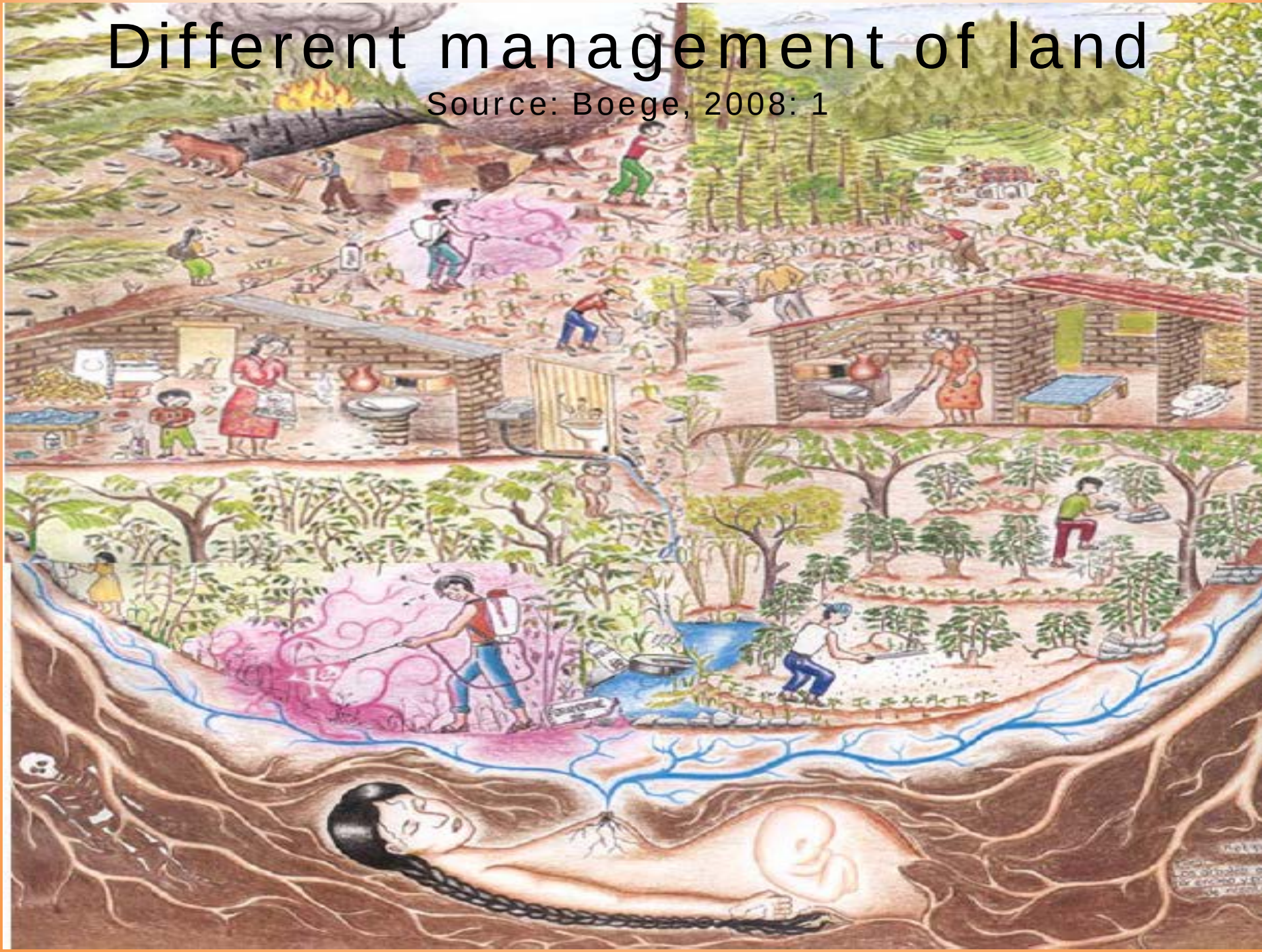


Improvement of soil fertility

- **Use bio-cultural knowledge**
- **Composting of organic waste and recycling of waste water**
- **Reduction and elimination of agro-chemicals**
- **Rotation of crops and association of leguminous with gramineous plants for soil fertility conservation**
- **Terracing of steep soils**
- **Reforestation with native forest species and fruit trees for consolidating terraces and curves**
- **Small scale orchard food production and food sovereignty**
- **Integrated pest management with poly-cultivation and organic combat**
- **Establishment of organic barriers to reduce wind and water erosion**
- **Restoration of forest in upstream watershed for water infiltration**
- **Rainwater harvesting and management of local irrigation systems**
- **Production of organic, diversified food crops which improve health of peasant and indigenous families**

Different management of land

Source: Boege, 2008: 1



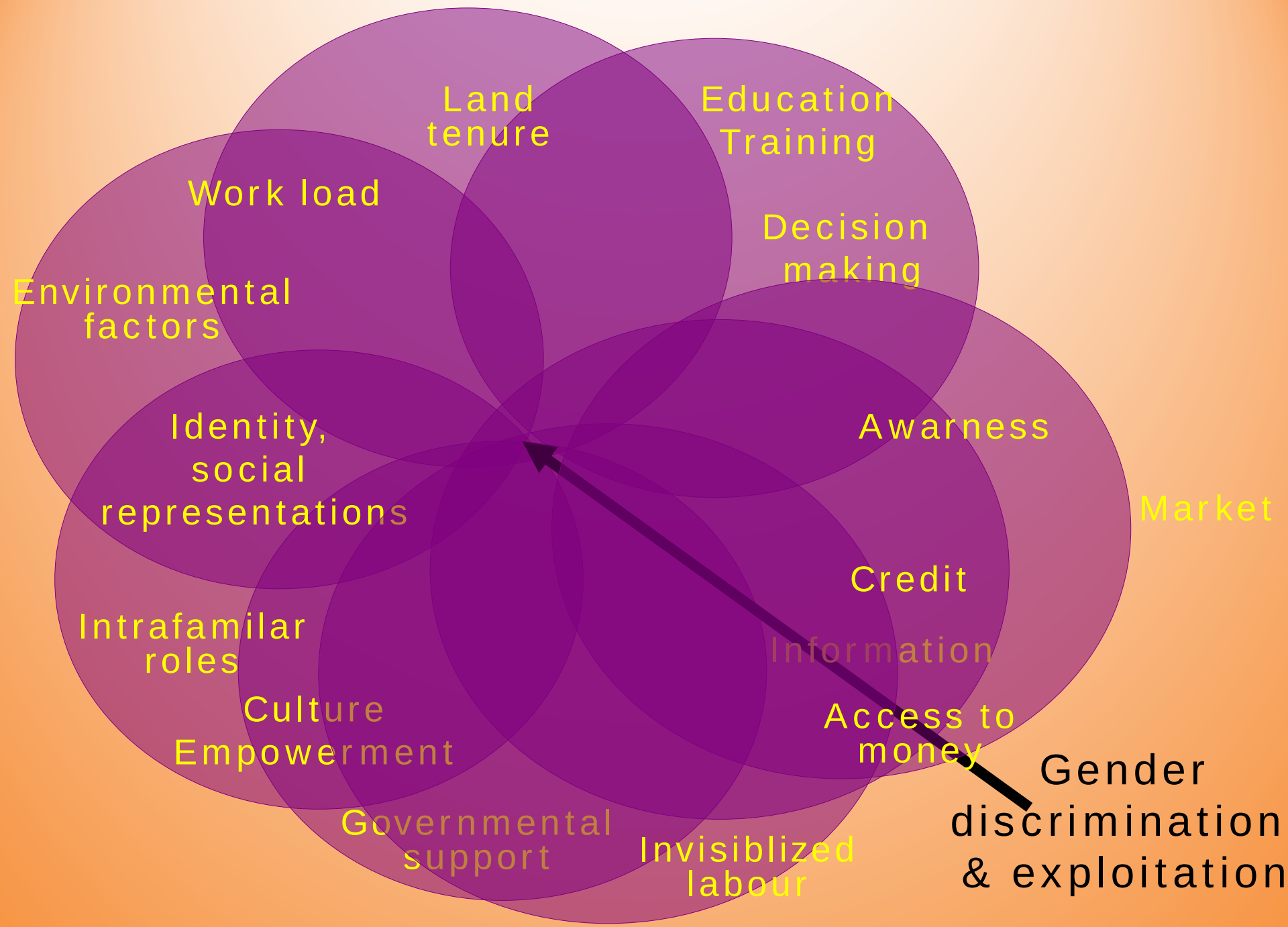


Resolution of resource conflicts

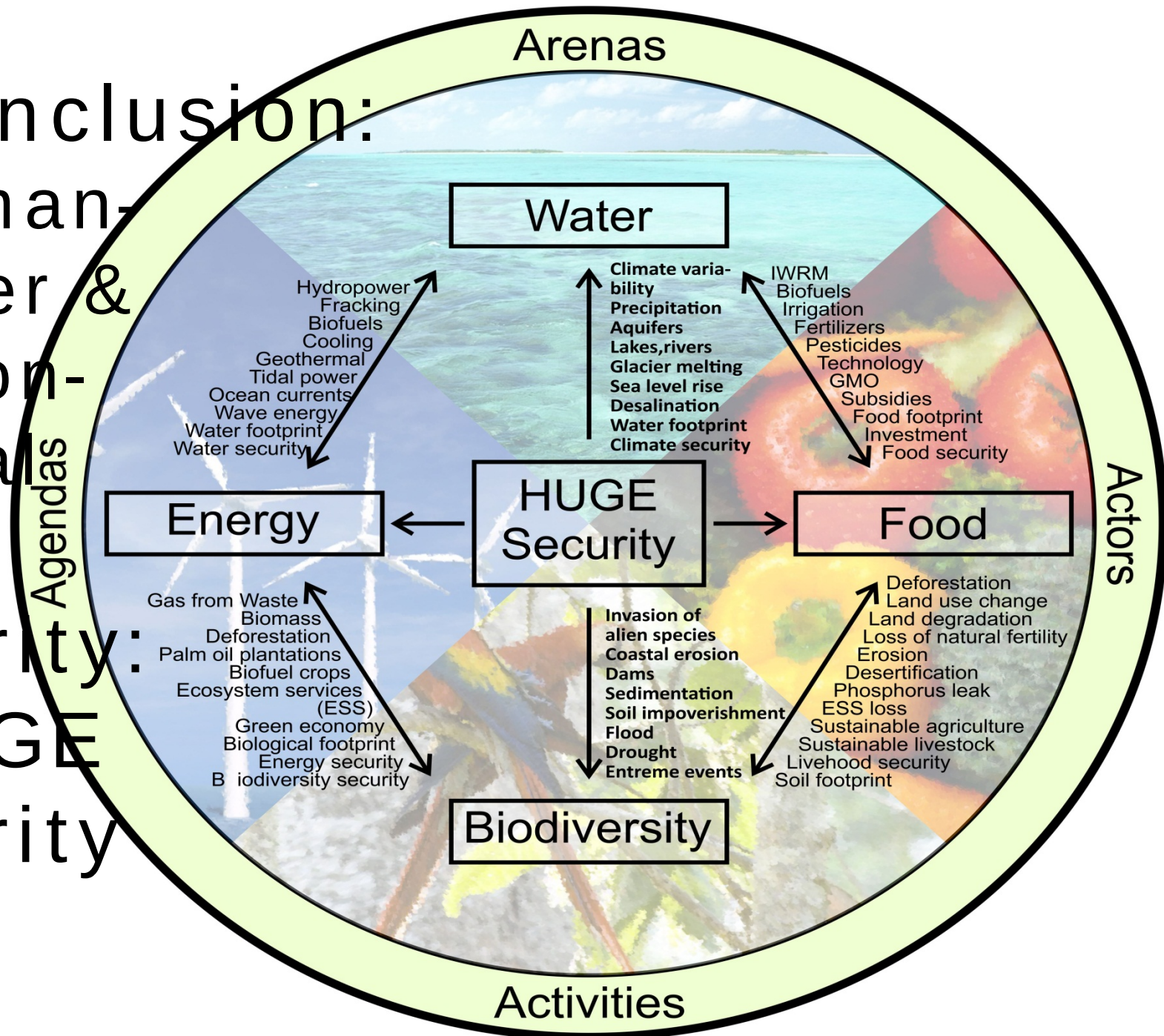
- 1. Define and speak out interests involved in resource conflicts by different sectors, and understand the arena which supports national and regional agendas, actors and activities.**
- 2. Develop with affected people and scientists analysis of damages in environment, health, income and livelihood**
- 3. Negotiate with the involved actors their interests and work out the contradictions, define the root causes, the existing alliances and the opponents. Try to find a common background based on the wellbeing of the people in the region.**
- 4. Define minimal consensus, establish an agenda for negotiation from the simplest to the more complex issues, which will affect people's livelihood**
- 5. Start to reinforce at local and regional level economic wellbeing and transparency in the negotiation process. Use mediators or facilitators for conflict management when the process is blocked.**
- 6. Agree on consensus in each phase of negotiation and establish a group of evaluation involving all parts, who is monitoring the implementation of the agreements**
- 7. Organize territorial and environmental planning for conserving and restoring the ecosystems and its services**

Conclusion





8. Conclusion: a Human- Gender & Environmental Agendas security: a HUGE security



A photograph of a sunset over a body of water. The sun is a bright, glowing orb on the horizon, casting a long, shimmering reflection across the water's surface. The sky is a gradient of orange and yellow, and the water in the foreground is dark with some ripples. The text "Thank you for your attention" is centered in the lower half of the image in a black, sans-serif font.

Thank you for your
attention